NATIONAL TRANSPORTATION SAFETY BOARD
**Investigative Hearing**
US Army PAT25, Sikorsky UH-60L and
PSA Airlines flight 5342
MHI RJ Aviation CL-600-2C10 (CRJ700), N709PS
Midair Collision in Washington, DC
January 29, 2025

| **Docket No.** | **SA-544** |
|---|---|
| **EXHIBIT** | |
| 7-HELO-B | |

# Helicopter Airworthiness Group Chairman's Factual Report – Attachment 1

(14 Pages)

DCA25MA108

# HELICOPTER AIRWORTHINESS

Group Chair's Factual Report – Attachment 1

NTSB Materials Lab Email Report – Pitot Line

## Chihoon Shin

**From:** Donald Kramer
**Sent:** Monday, April 21, 2025 10:38 AM
**To:** Chihoon Shin
**Subject:** Materials Laboratory Factual Report - Email
**Attachments:** Fitting_002.jpg; Fitting_004.jpg; Mat_Lab_0766.JPG; Mat_Lab_0770.JPG; Mat_Lab_0772.JPG; Opposite Run End Tube_001.jpg; Tube_002.jpg; Tube_003.jpg; Tube_006.jpg; Tube_007.jpg

ACCIDENT INFORMATION
Location: Washington, District of Columbia
Date: January 29, 2025
Vehicle: Sikorsky UH60L, UNREG
Investigator: Chihoon Shin, AS-40

COMPONENTS EXAMINED
Flared tube bulkhead tee fitting with attached tube segments as described below.

EXAMINATION PARTICIPANTS
Donald Kramer, Ph.D.
National Transportation Safety Board
Washington, DC 20594

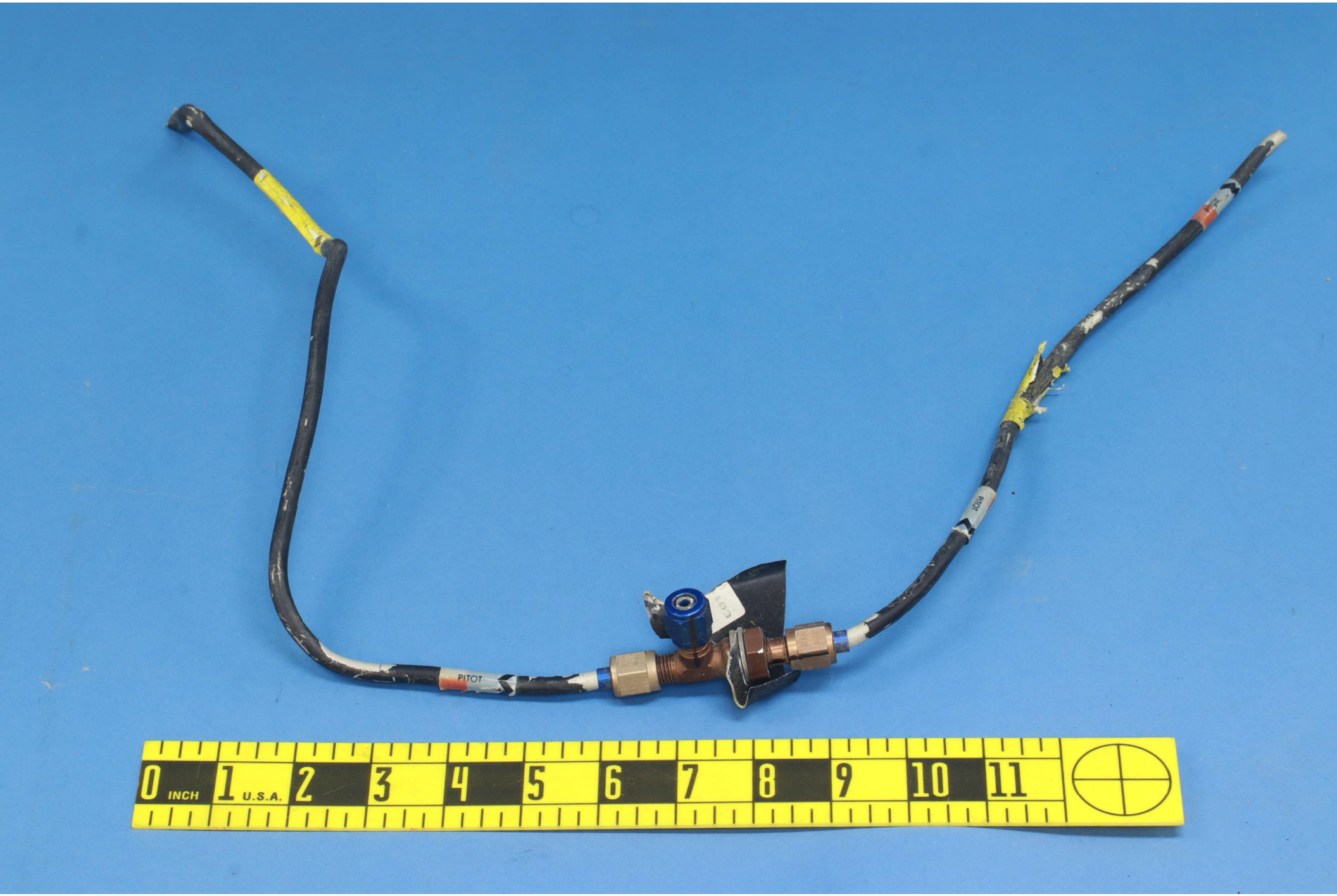
DETAILS OF THE EXAMINATION
A flared tube bulkhead tee fitting with the bulkhead attachment on the run was submitted to the NTSB Materials Laboratory for examination. The bulkhead nut and adjacent flared tube B-nut were loose. The bulkhead nut was reportedly loosened during wreckage examination. The B-nut was reportedly found loose during the wreckage exam. The other two B-nuts, one on the opposite end of the run and the other on the branch, were not loose at the time of examination.

Varying lengths of fractured aluminum tubes were attached to each leg of the tee. Each tube was flared at the end that was joined to one of the tapered ends of the fitting. A ferrule, slipped onto the outside of the tube, compressed the flared end of the tube against the tapered end of the fitting. The compressive load was generated by the B-nut, which slipped over the outside of the ferrule and engaged with male threads on the fitting. The tube segment associated with the loose nut was approximately 13 inches long, the segment on the opposite side of the run was approximately 18 inches long, and the segment on the side branch was fractured at approximately the top of the nut and ferrule. The ends of all tube segments exhibited deformation features and fracture features consistent with overload fractures. On the 13-inch-long tube segment, there was an impression in the sidewall of the tube adjacent to the opposite fractured end, consistent with contact against the edge of another ferrule.

The tube segment associated with the loose B-nut was examined for any notable damage features (besides the fractured end described above) but none were found. There were no fractures in the tube or notable wear features near the joint. The tube was bent near its flared end which resulted in the tube impinging on the edge of the ferrule. A similar feature was seen on the opposite end of the tube segment (as noted above) and on the tube segment attached to the opposite side of the run. The two tube

segments joined to either end of the run were removed and the contact faces on the flared tube ends were examined with the aid of a stereomicroscope. Circumferential marks were observed on both flared end faces. The segment from the opposite end of the run exhibited a single set of marks at regularly spaced intervals, consistent with machining mark imprints from the tapered surface of the fitting. The segment associated with the loose nut exhibited multiple sets of circumferential marks.

Donald Kramer, Ph.D.
Materials Engineer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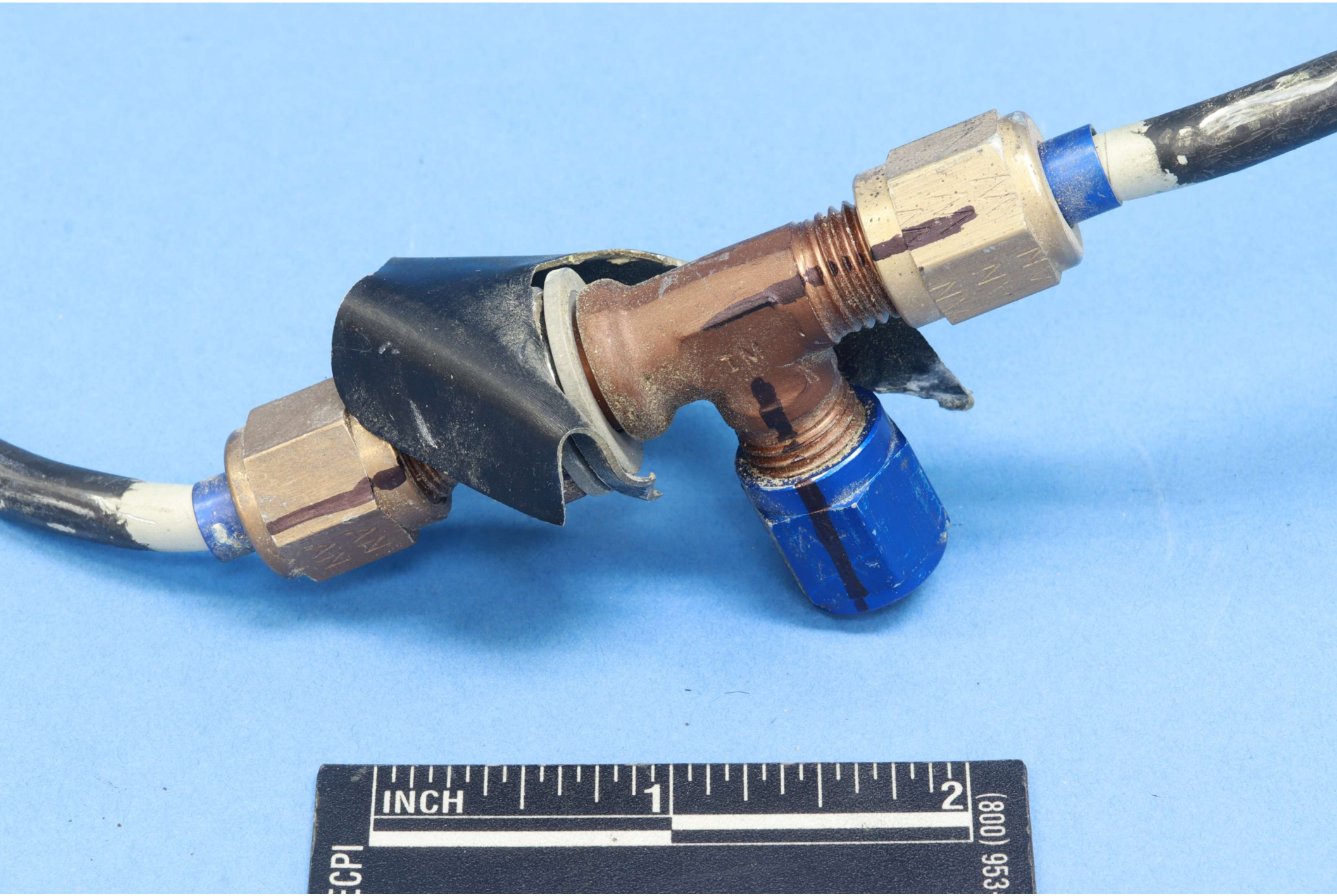
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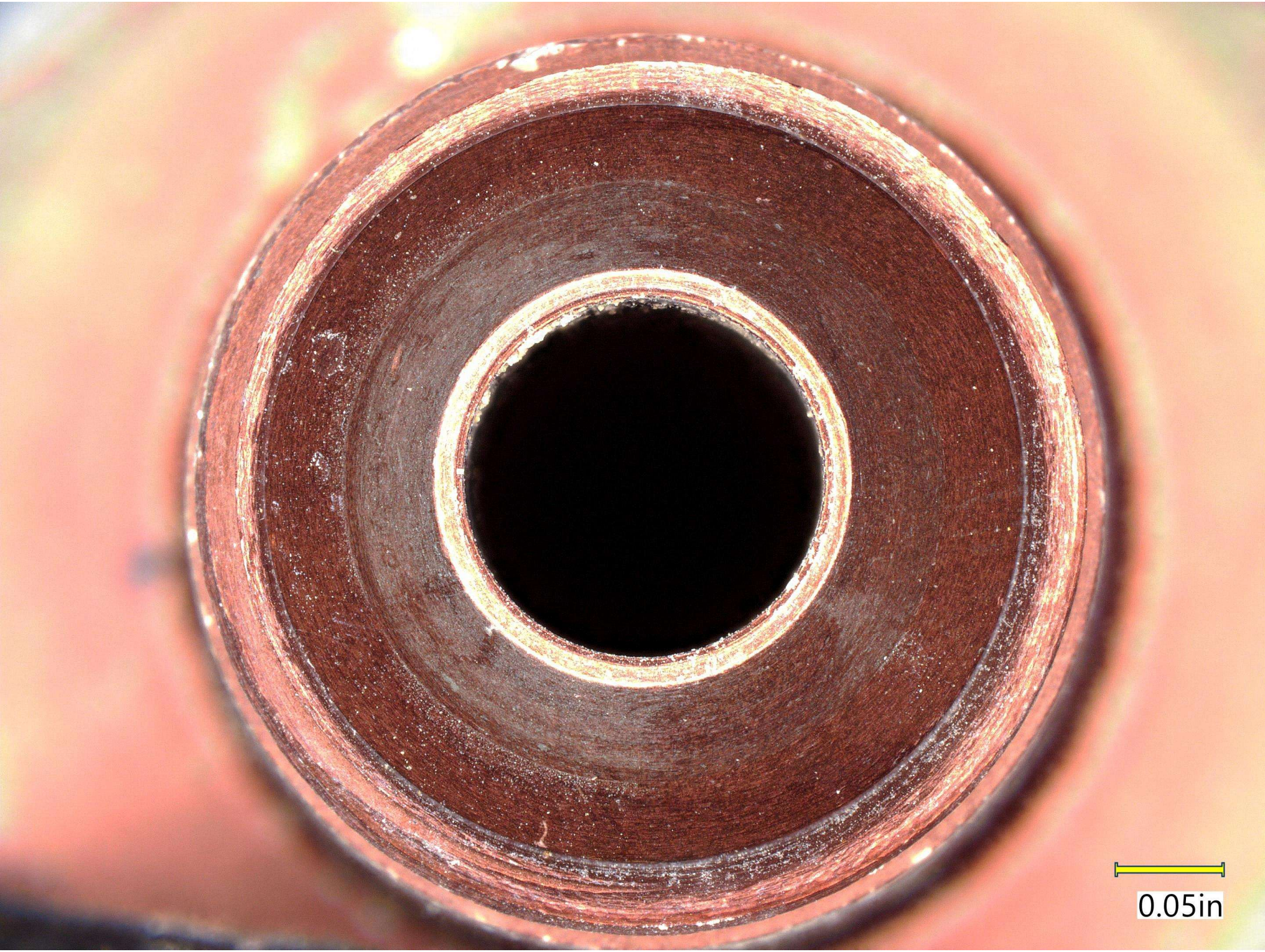
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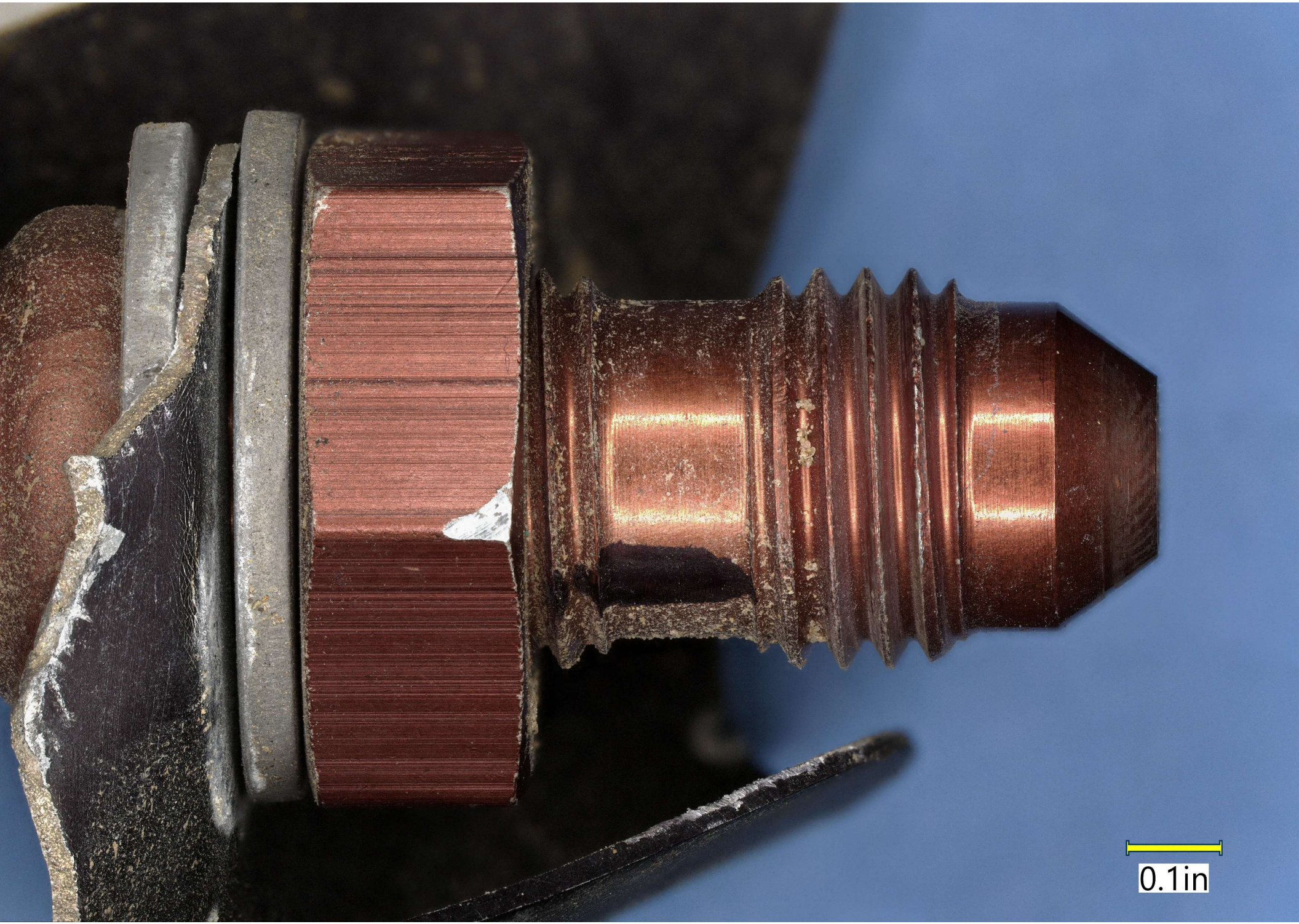
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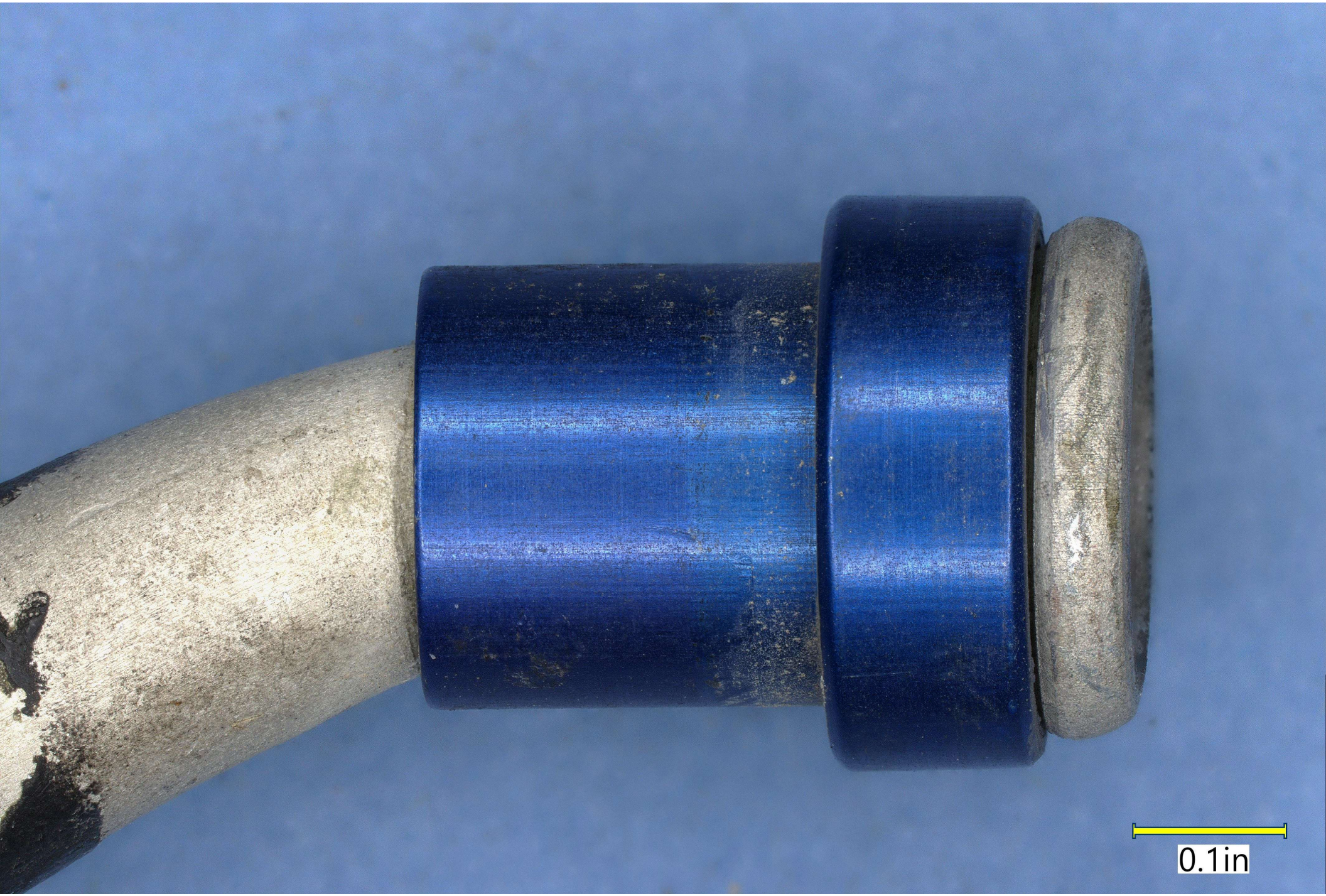
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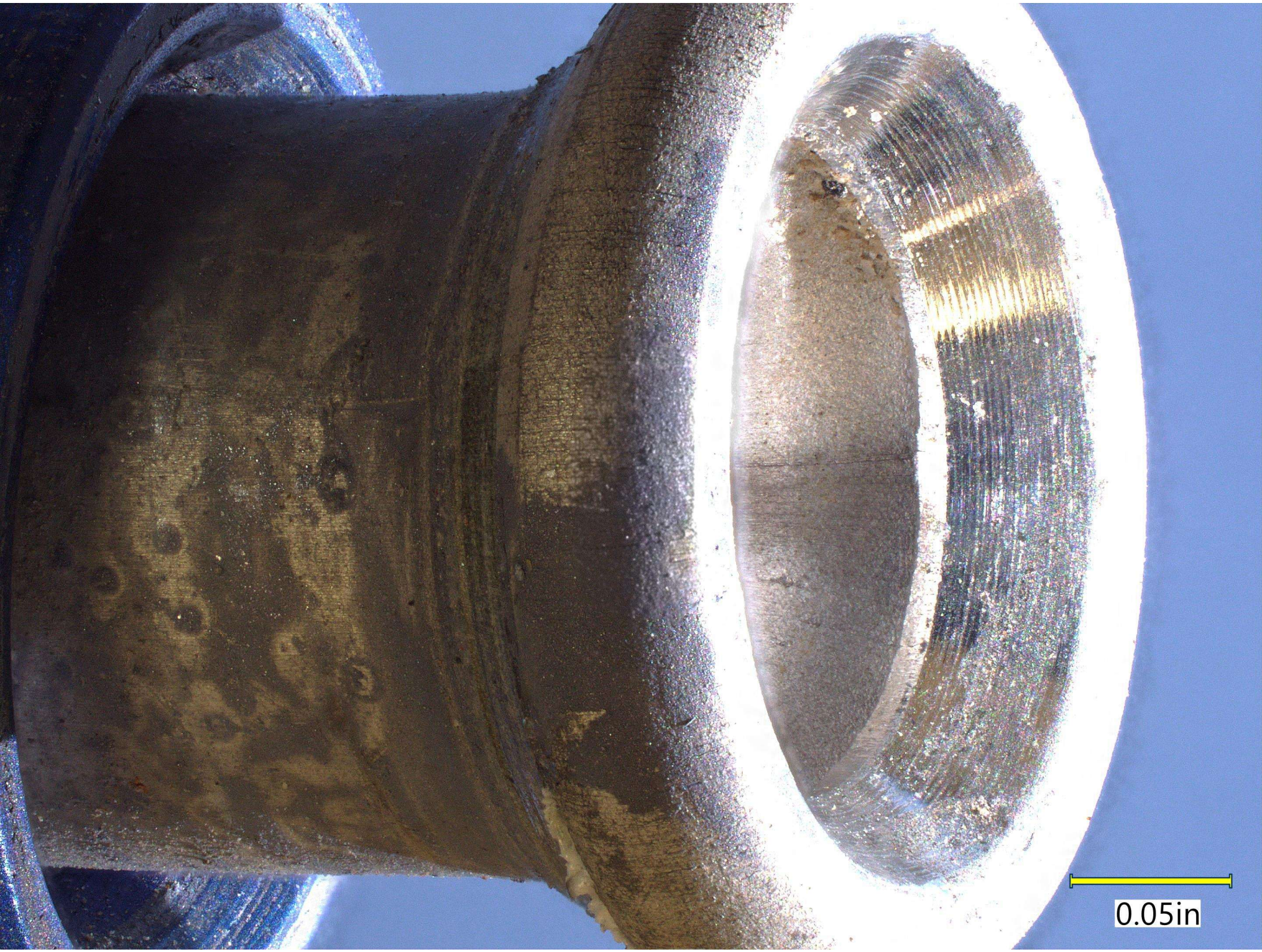
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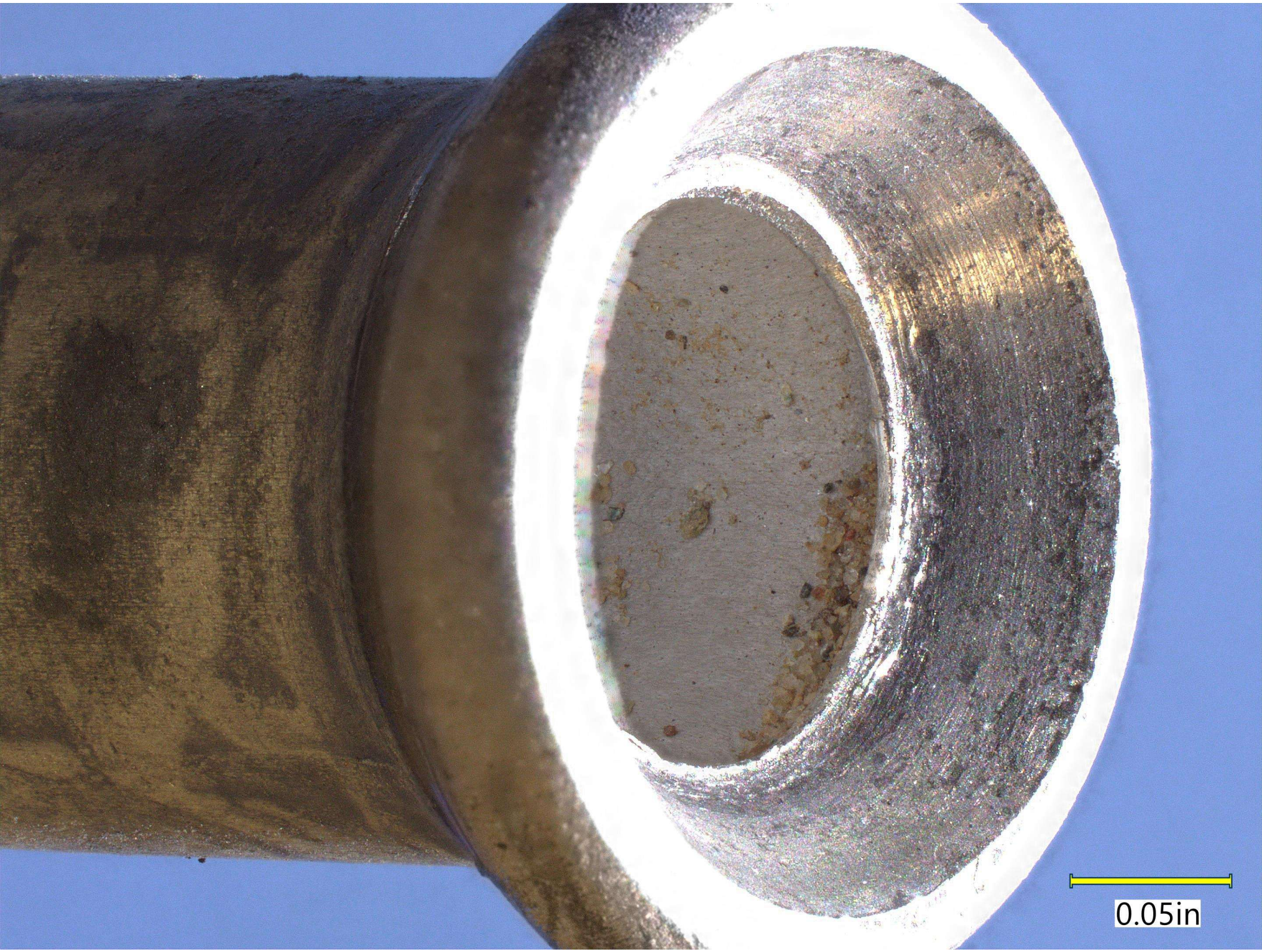
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